

REMARKS

This Amendment is in response to the Office Action dated May 21, 2007, in which claims 1-24 were rejected.

With this Amendment, independent claims 1, 18 and 22 have been amended, and dependent claims 20, 21, 23 and 24 have been cancelled. New independent claim 25 has been added. In view of the above amendments and the following remarks, Applicants respectfully request reconsideration and allowance of all pending claims 1-19, 22 and 25.

I. CLAIMS REJECTIONS UNDER §101

The Office Action rejected claims 20-23 under 35 U.S.C. §101 because the claimed invention was allegedly directed to non-statutory subject matter. Specifically, the Office Action stated that claims 21-23 are drawn to functional descriptive material not claimed as residing on a computer-readable medium.

Applicants respectfully disagree and argue that so-called “signal claims” are in fact statutory. However, with this Amendment, claims 20, 21 and 23 have been cancelled, and claim 22 has been amended without prejudice to further clarify the statutory subject matter, as requested in the Office Action. Applicants reserve the right to pursue signal claims in one or more continuation applications.

Applicants therefore respectfully request that the claim rejections under §101 be withdrawn.

II. CLAIM REJECTIONS UNDER §102(b) BASED ON VYNNE ET AL.

The Office Action indicated that claims 1-7, 11-15 and 17-24 were rejected under 35 U.S.C. §102(b) as being anticipated by Vynne et al. (U.S. Patent 5,960,081), hereinafter Vynne. Of these claims, claims 1, 18 and 22 are independent.

A. Independent Claim 1

Vynne describes a technique of marking moving pictures with watermark information by embedding information into motion vectors.

With this technique, a subset $U(n)$ is selected from the set of motion vectors $V(n)$ and, if necessary, either the x or y-coordinate of the motion vectors are modified according to a

predefined bitset. The number of motion vectors selected from $V(n)$ depends on the number of blocks suitable for coding in a non-visible sense.

The Office Action states that Vynne discloses a “motion vector being identified by its coordinates (see abstract, lines 5, 6) in a reference space (fig. 3.2, num. 321), partitioned into two types of complementary zones (corresponding to a sky and house in fig. 2.4 B), each having a distinct binary value associated with it (due to watermarking said fig. 3.2, num. 321).” Specifically, the Office Action alleges that the two types of complementary zones correspond to a sky and house in the Vynne patent.

With this Amendment, claim 1 has been amended to define the location of the complementary zones. Claim 1 now recites a “motion vector identified by its coordinate in a reference space, partitioned into two zones of complementary types, one zone surrounding the other zone, each zone having a distinct binary value associated with it.” This is supported by the specification, at page 19, line 22, which, in a non-limiting example of the present invention, discloses that “zone Z2 is located at the periphery of Z1, between Z2 and the boundaries of the block.”

Vynne does not recite “a motion vector being identified by its coordinates in a reference space partitioned into two zones of complementary types, one zone surrounding the other zone, each zone having a distinct binary value associated with it” and “an insertion step implementing, if necessary, a modification of the coordinates of the motion vector so that it is located in a binary value zone corresponding to said watermarking bit to be inserted.”

Vynne does not disclose, teach or suggest a reference space comprising blocks which are divided into two types of zones. In a non-limiting example of the present invention shown in Figure 3, the disclosed reference space consists of a plurality of blocks (Fig. 3, ref. 30), each block comprising two complementary zones (Fig. 3, ref. Z1 and Z2), each having a distinct binary value associated with it (Fig. 3, exemplary ref. Z1=1 and Z2=0). Further, the disclosed reference space may be used for determining, for each of the motion vectors of the set T of selected motion vectors (on which the watermark will be inserted), the block and zone of the block in which the motion vector is located.

Then, according to the invention, the method follows by “determining if the motion vector is located in a zone associated with a binary value corresponding to the watermarking bit to be inserted and, in case the motion vector is located in a zone associated with a binary value not corresponding to the watermarking bit to be inserted (for example, a motion vector located in $Z2=0$ and watermarking bit = 1)” and “modifying the coordinates of the motion vector so that it is located in a zone of the reference grid associated with the watermarking bit value.

Instead, Vynne suggests at col. 13, lines 44-49 the following.

The frame(n) 320 is divided into a number of blocks. Each block is assumed to present somewhere in frame(n-1) 321. So, to generate frame(n) 320, a set of motion vectors which describes the translation of each block from frame(n-1) 321 to frame(n) 320 is sufficient.

Clearly, Vynne does not teach, suggest or disclose that the blocks are divided into two types of zones.

Claim 1 also discloses an insertion step implementing, a modification of the coordinates of the motion vector so that it is located in a binary value zone corresponding to said watermarking bit to be inserted. This is not shown or taught in the Vynne patent.

Rather, Vynne suggests, at col. 14, line 54 to col. 15, line 20, that the x or y-coordinate of a motion vector is either incremented or decremented by an integer value corresponding to a movement of the block by one pixel, that is, making $x^*=x+1$, or $y^*=y-1$.

Indeed, if the motion vector were located in a zone associated with a binary value not corresponding to the watermarking bit to be inserted, and the block were displaced by one pixel, as taught by Vynne, then it would not always modify the coordinates to make the motion vector now located in a zone of the reference grid associated with the watermarking bit value. Accordingly, the watermarking approach, as disclosed in the present invention, would not work in this case.

Consequently, independent claim 1 is new and non-obvious in view of Vynne. Additionally, Applicants respectfully submit that dependent claims 2-17 and 19 are allowable as well by virtue of their dependency, either directly or indirectly, from allowable independent claim

1.

B. Independent Claims 18

The Office Action rejected claim 18 stating the same argument as that presented for claim

1.

Claim 18, directed to a device for the watermarking of a video image sequence, has been amended along the same lines as claim 1.

Accordingly, in view of the above claim amendments and Applicants' arguments presented above for independent claim 1, independent claim 18 is not anticipated by the Vynne.

C. Independent Claim 22

The Office Action rejected claim 22 stating the same argument as that presented for claim

1.

Claim 22, directed to a device for the watermarking of a video image sequence, has been amended along the same lines as claim 1.

Accordingly, in view of the above claim amendments and Applicants' arguments presented above for independent claim 1, independent claim 18 is not anticipated by the Vynne.

III. CLAIM REJECTIONS UNDER §103(a)

The Office Action rejected claims 8 and 16 as being unpatentable over Vynne in view of Han et al. (U.S. Patent 6,845,130), hereinafter Han.

The Office Action rejected claims 9 and 10 as being unpatentable over Vynne in view of Han, as applied to claim 8, and further in view of Vynne.

Han relates to the field of video data encoding, and more precisely to a method for encoding a variable-motion video data signal. The Han reference discloses a motion estimation and compensation technique for video compression.

Han does not relate to the watermarking of images or sequences of images. Further, Han does not suggest the association of distinct binary values with each of two zones of complementary types, to adaptively search and select the insertion zone of the motion vector for watermarking. There is no motivation, teaching or suggestion in Han of a "reference space, partitioned into two zones of complementary types."

IV. NEW CLAIM 25

New independent claim 25 has been added. Favorable action is respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: /David D. Brush/
David D. Brush, Reg. No. 34,557
900 Second Avenue South, Suite 1400
Minneapolis, Minnesota 55402-3319
Phone: (612) 334-3222 Fax: (612) 334-3312

DDB/DPP/tkj